

## THE TREATMENT OF TRICHOMONAS VAGINITIS\*

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The treatment of trichomonas vaginitis is often regarded as a simple matter, but a systematic study reveals many difficulties and complexities. Certain important characteristics of the disease must be taken into consideration in planning treatment. They are as follows.

1. Trichomonas vaginitis is very frequently associated with a proved gonococcal infection. In the present series 189 cases were treated at a military hospital over a period of one year. In sixty cases or thirty-two per cent a proved gonococcal infection was also present.

2. There is reason to believe that trichomonas infections frequently mask gonococcal infections. In cases where this occurs it is sometimes possible to show the presence of the gonococcus by a prolonged series of tests, but the delay involved usually makes this impracticable. Consequently many cases in which the history and clinical findings provide strong evidence that gonorrhoeal infection is present are diagnosed as uncomplicated trichomonas vaginitis from lack of positive evidence as to the presence of the gonococcus.

3. Many trichomonas infections have a strong tendency to relapse after a course of treatment which has been apparently successful. These relapses often occur without symptoms, or with symptoms so slight that the patient ignores them. The importance of such relapses cannot be disregarded, for experience shows that routine tests taken from the relapsing patient who has no symptoms sometimes reveal gonococci in sites where they have not been found previously.

It may be said then, that in treating trichomonas infections three aims should be kept in view: to eliminate a known or suspected gonococcal infection, to cure the trichomonas infection and to detect and treat relapses of either or both infections. Particular emphasis may be given to this last aim.

It is not the usual practice to insist on the same period of post-treatment-observation in trichomonas infections as in cases of proved gonorrhoea. Yet to do so seems a very obvious precaution when one considers the very close association between the two conditions, the high frequency of relapse in trichomonas infections, and the possibility that such relapses may remain unnoticed by the patients. From these considerations it follows that any course of treatment is incomplete, and in many cases of very little value, if no arrangements are made for post-treatment observation and tests.

### Local treatment

Many methods of treating Trichomonas vaginitis have been described and almost all of them have depended for results on local applications to the vaginal mucous membrane. The preparations used fall roughly into three groups.

(1) Simple antiseptics used to paint the vaginal mucous membrane, or in douches. Green soap, merurochrome, acriflavine, silver nitrate, and gentian violet have all been used in this way.

(2) Preparations which are said to have a specific action on the parasite, including Acetarsol Vaginal Compound (the synonyms of which are Devegan and Stovarsol), Carbarsone, Negatol, Vioform, and preparations of silver picrate. These are used in pessaries, or in liquid or powder form.

(3) Preparations of lactic acid, or of substances from which lactic acid can be produced by the action of Döderlein's bacillus. These are introduced into the vagina with the object of producing a hyperacid environment which may inhibit the growth of the parasite.

Peterson (1938) described the treatment of 1,405 cases in a United States Naval Hospital: 210 were treated with Carbarsone, 500 with Vioform and 695 with silver picrate. In each group the course of treatment took forty-two days, and with all three methods between seventy and eighty per cent of cases were cured after one

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course of treatment, and between twenty and thirty per cent after two courses. Complete failures amounted to two per cent of the total. These patients were examined after each of the next three menstrual periods following their course of treatment. The extent of subsequent observation in this series is not stated.

Elden (1942) describes the treatment of thirty-four patients in the Department of Obstetrics and Gynecology of the University of Rochester, Minnesota. The method of treatment was as follows. A douche of one teaspoonful of lactic acid in one quart of water was followed by the insertion into the vagina of a compressed tablet containing 3.5 grammes of  $\beta$ -lactose and enough citric acid and sodium bicarbonate to produce about 300 cc. of carbon dioxide. The gas produced served to spread the lactose through the vagina. This procedure was repeated twice daily for twelve days with the result that fifteen patients were cured after two weeks' treatment, ten patients were cured after treatment up to three months, and five patients were cured after treatment lasting up to eleven months. There were four failures, and twelve other patients relapsed after apparent cure. The patients treated in this series were examined twice a month during treatment and monthly for three months after cessation of treatment.

Filler, Drezner and Adamo (1942) describe the treatment of eighty-seven cases in the Bellevue Hospital, New York, with Negatol. Fifty-one per cent were cured after treatment lasting an average period of eight weeks. These patients were examined monthly for three months after cessation of treatment. Forty-four per cent showed marked improvement after treatment lasting an average period of seven weeks. These patients were not examined after cessation of treatment. There were five known failures after sixteen weeks of treatment. These results are typical of the general experience which suggests that the measure of success obtained by local treatment is determined more by the length of time devoted to treatment than by the actual preparation chosen.

### Routine treatment in the present series

The routine treatment used for the past eighteen months was based on the principles already enumerated. All patients were treated as in-patients. On admission routine vaginal, cervical and urethral smears, and cervical and urethral cultures were taken on two successive days. The patient was then given a course of treatment lasting one week, chosen from the following routine schemes of treatment.

(1) Oral sulphonamide combined with vaginal insufflation of sulphanilamide powder : eighty-two cases.

(2) Oral sulphonamide combined with the local use of acetarsol vaginal compound : twenty-two cases.

(3) Oral sulphonamide combined with local use of both sulphanilamide powder and acetarsol vaginal compound : sixty-five cases.

(4) Acetarsol vaginal compound used alone : twenty-two cases.

The large majority have been treated with schemes one, two and three ; four was introduced in order to obtain a basis for comparison for the purpose of this paper, but the available figures are too small for final conclusions to be drawn.

Sulphapyridine was used in most cases as the oral sulphonamide in dosage of 4.5 grammes daily for five days, but has recently been replaced by sulphathiazole in dosage of six grammes daily for three days with striking diminution of toxic effects. In all cases where a sulphonamide and local treatment were combined, the local treatment was started on the same day as the sulphonamide and continued for one week. When sulphanilamide powder was used it was applied daily as follows : a Cusco's bi-valve speculum was passed, the vagina was first carefully swabbed dry, and the powder insufflated until a thin film covered the whole of the mucous membrane of the vagina and cervix. When acetarsol vaginal compound was used two tablets were inserted high into the vagina at night after the patient had retired to bed. On the day immediately following cessation of treatment a vaginal smear was taken ; if this was satisfactory, in the respect that no pus cells or trichomonas parasites were present, smears and cultures were taken on the

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second day, and a vaginal smear on the third. If these were all satisfactory the patient was discharged from hospital, and arrangements made for her to be examined immediately after each of her next three menstrual periods. At these later examinations vaginal smears, and cervical and urethral smears and cultures were taken; if all three examinations proved satisfactory the patient was discharged as cured. If any of the smears taken immediately following the first week of treatment were considered unsatisfactory, treatment was continued for a further week. In almost all cases this further treatment consisted of the use of acetarsol vaginal compound, two tablets at night, without other treatment. The routine of observation was then followed as already described. The treatment of patients who did not respond to the second week of treatment, or who relapsed during the period of observation, is discussed below.

### Rationale of treatment

The routine described followed as far as circumstances allowed the requirements which have already been stated. The routine use of sulphonamides by mouth was designed to cover both the cases in which gonorrhoea had been proved, and those in which it was suspected. Insufflation with sulphanilamide powder was used in local treatment as a remedy for known or suspected co-existing gonorrhoeal infection, but also in the hope that it might prove to have some specific effect on the trichomonas infection itself. On the evidence available this hope proved to be unfounded. Acetarsol vaginal compound was used because it was found to produce prompt cessation of symptoms and improvement of local inflammatory conditions and at the same time was easily available in good supply. The routine course of treatment was of necessity short. All the patients treated were serving in the Forces, and were drawn from a very wide area. Attendance as out-patients was impossible and it was also impracticable to advise any course of treatment involving the use of douches or pessaries to be inserted by the patient herself. Most of these women live a life which affords little or no privacy and such treatment would cause embarrassment to the patient and to others, and consequently in most cases would not be properly carried out. The whole of the treatment had to be completed while the patient was in hospital, and it was obviously of great importance to return all patients to their units in the shortest possible time. The routine subsequent examinations ensured discovery of relapses and control of those cases where the short treatment had been inadequate.

TABLE I  
TREATMENT OF TRICHOMONAS VAGINITIS—189 CASES

Method of Treatment	No. of Cases Treated	Success		Partial Success		Failure	
		Follow-up complete	Follow-up incomplete	Follow-up complete	Follow-up incomplete	Immediate	Relapse
1. Oral Sulphonamide + Sulphanilamide Insufflations ...	82	7	9	12	25	11	18
2. Oral Sulphonamide + Acetarsol Vaginal Compound ...	22	2	11	—	4	2	3
3. Oral Sulphonamide + Sulphanilamide Insufflations + Acetarsol Vaginal Compound ...	65	13	29	2	7	3	11
4. Acetarsol Vaginal Compound Alone...	20	4	8	—	3	2	3
Totals ...	189	26	57	14	39	18	35

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### Results of treatment

Every attempt has been made to follow up patients, but owing to the exigencies of the service only twenty-seven per cent have completed their surveillance.

Table I shows the results obtained by means of the four schemes of treatment already described. The figures show numbers of cases. Those cases shown under the heading "Success" were all discharged from hospital after one week of treatment. Those shown under "Partial Success" were discharged from hospital after two weeks of treatment. The subdivisions in these groups show on the right those patients who have completed the observation period, and on the left those in whom it has been impossible to certify a final cure. Failures are divided into "Immediate Failures," that is patients who have been given more than two weeks' treatment without apparent cure, and "Relapses," that is, patients who have been discharged from hospital in an apparently satisfactory condition and re-admitted later with a recurrence of signs and symptoms.

Table II shows percentages of "Success," "Partial Success," and "Failure" in the four schemes of treatment. No distinction has been made in these figures between patients who have completed their follow-up and those who have not.

The numbers are few and the totals treated in each group are so unequal as to form an unsatisfactory basis for comparison. As far as the evidence goes it may be deduced that the most satisfactory of these schemes of treatment were those which included the use of acetarsol from the beginning of treatment. In consequence of this procedure the immediate successes were greater in number and the ultimate failures fewer. In the one scheme which did not include the use of acetarsol from the beginning the proportion of delayed successes was considerably greater than that of immediate successes, a result which was probably due to the later use of acetarsol. The reason for the high proportion of ultimate failures in this group is not clear.

TABLE II  
TREATMENT OF TRICHOMONAS VAGINITIS—189 CASES

Method of Treatment	Success	Partial Success	Failure
1. Oral Sulphonamide + Sulphanilamide Insufflations ... ..	20%	46%	35%
2. Oral Sulphonamide + Acetarsol Vaginal Compound ... ..	59%	18%	23%
3. Oral Sulphonamide + Sulphanilamide Insufflations + Acetarsol Vaginal Compound ... ..	64%	14%	22%
4. Acetarsol Vaginal Compound Alone...	60%	15%	25%

### Failures and relapses

Failures to respond to treatment and relapse after apparently successful treatment present special difficulty in the treatment of trichomonas vaginitis. Certain predisposing causes must be remembered when dealing with these difficult cases.

(1) During the menstrual period the condition of the vagina seems to be favourable to the growth of the parasite. The majority of relapses are noticed immediately, or shortly after the menstrual period. Examinations during the period of observation following treatment should therefore take place immediately after a menstrual period. It has been suggested that if treatment is planned to continue through the menstrual period which follows the routine course, relapse may be less likely to occur. This has not been done in the present series.

(2) Conditions during pregnancy are also favourable to the growth of the trichomonas parasite. Patients who have had apparently successful treatment frequently relapse during the early months of a subsequent pregnancy. In treatment during pregnancy relapse must be considered a probability, and repeated courses of treatment will probably be necessary throughout the period of gestation.

(3) The presence of condylomata acuminata, which are sometimes associated with trichomonas vaginitis, may also result in persistence of symptoms. In these cases treatment for the trichomonas condition is usually necessary until the warts have been removed surgically and for some time afterwards.

(4) Faulty technique of treatment must be regarded as a possible cause of failure, especially when patients themselves carry out the treatment.

(5) It must be remembered that an apparent relapse may be a re-infection. Experience suggests that this does occur, but I know of no criteria by which re-infection may be distinguished from relapse. The possibility of re-infection should be explained to the patient and sexual intercourse should be avoided during treatment and the period of observation following treatment.

#### **Treatment of failures and relapses**

No systematic method of dealing with these difficult cases has been devised, but the procedure adopted has been to "ring the changes" on the routine schemes, and in most cases ultimate success has resulted rather from long continuation of treatment than by virtue of the particular method chosen.

In the series of cases treated eighteen cases (shown as immediate failures) required prolonged treatment; four patients in this group were pregnant, two had large masses of vulval warts, and one had an extremely narrow vaginal introitus, the result of perineorrhaphy, which made local treatment very difficult. In the remaining eleven cases there was no apparent cause for failure.

Of thirty-three patients who were treated for relapse, two refused further treatment. The same schemes were used as for new cases, four being treated under scheme one, five under scheme two, fourteen under scheme three, and ten under scheme four.

The results were twenty-four successes, three partial successes, one immediate failure, and five relapses on two or more occasions.

#### **High fever therapy**

Four patients suffering from trichomonas vaginitis have been treated by high fever therapy. The routine used was as follows. In each case the patient was given six grammes of sulphathiazole in the twelve hours preceding treatment, two tablets of acetarsol vaginal compound were inserted per vaginam on retiring the previous night, and two more tablets were inserted at the height of fever. Fever was maintained at 106° F. for eight hours and a further two tablets of acetarsol inserted during the latter half of the fever session.

For the first patient so treated who was suffering from gonorrhoea, salpingitis and trichomonas vaginitis the high fever treatment was undertaken on account of the gonorrhoeal condition. It was noticed that the trichomonas vaginitis was much improved after high fever, and although this patient required further treatment, including a further session of high fever, for her gonococcal infection, there was no return of the trichomonas parasite. She was seen three months after cessation of treatment when her condition was still satisfactory.

In view of the result obtained in this case it was considered justifiable to treat three other patients, who had failed to respond to prolonged treatment for trichomonas vaginitis and had relapsed on several occasions by means of high fever. In two of these cases the gonococcus had been isolated; the third had been diagnosed as uncomplicated trichomonas vaginitis.

**Case 1.** This patient had already had four months of almost continuous treatment for trichomonas vaginitis with no improvement. She had a very severe degree of vaginitis with profuse discharge. After high fever treatment there was complete relief from symptoms for one week. The discharge then recurred. The trichomonas parasite was present in the vaginal secretion, but the vaginitis was much less severe than before treatment. At this stage she was discharged from the service for other reasons, and there was no opportunity for further treatment.

**Case 2.** This patient had had treatment for trichomonas vaginitis over a period of eight months. After high fever there was complete relief from symptoms for one month. This was the longest period of relief that she had had since the onset of the condition. After the first months he noticed a very slight discharge, which gradually became worse, and she was readmitted to hospital three months later. The degree of vaginitis was then not so severe as before high fever. Further treatment by high fever is being considered in this case.

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**Case 3.** This patient had previously had practically continuous treatment for four months with no relief. There was a very severe degree of vaginitis. High fever was followed by complete relief for one week. Relapse then occurred, but the condition was very much improved. A second treatment was given followed by complete absence of signs and symptoms. She was discharged from hospital three weeks after treatment when her condition was still satisfactory. Sufficient time has not elapsed for any further observation on this patient to be made.

### Summary

One hundred and eighty-nine patients were treated for trichomonas vaginitis, and of these sixty (thirty-two per cent) were found to have an associated gonococcal infection. Four schemes of treatment were used and a comparative assessment of their value attempted. The numbers were too few and too unequal to permit valuable conclusions to be drawn. The combination of sulphonamide by mouth and by local insufflation, with local treatment designed to cure the trichomonas vaginitis, was employed as a means of eliminating evident or undiagnosed gonococcal infection. A high proportion of relapses occurred which, it was considered, might be due to the short course of treatment rendered essential by the exigencies of the Service. High prolonged fever with premedication by sulphathiazole, and accompanied by the vaginal use of acetarsol tablets was employed in four cases.

### Conclusions

- (1) Trichomonas vaginitis is a difficult disease to treat and with the methods employed a high proportion of relapses occur.
- (2) The standards of observation should be the same as for gonococcal infections.
- (3) The absence of bacteriological evidence of coincident gonococcal infection cannot be accepted as a reliable method of excluding gonorrhoea in all cases. Bacteriological difficulties are much increased by the presence of the parasite.
- (4) The practice of giving oral sulphonamides as a routine in the treatment of trichomonas infections has much to recommend it.
- (5) The immediate clinical results obtained after high prolonged fever in cases of trichomonas vaginitis which have resisted all other forms of treatment justify a further trial of this method.

### REFERENCES

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### DISCUSSION

The President, Brigadier T. E. Osmond, speaking as a pathologist, said he was particularly interested in the diagnostic aspects. He had always held and was glad to have his view confirmed that dark ground microscopy was the easiest and best method of diagnosis, although there were other methods of identifying *T. vaginalis*. He had a distinguished gynaecological colleague who declared that he could smell the trichomonas. In his official capacity he had had a considerable fight to get rid of the expression "venereal warts," but he thought one could say that now the term was obsolete. With regard to treatment he also felt encouraged to hear that some patients were cured; perhaps it was in spite of treatment. Personally he did not think that they were ever cured and had never seen one who was. Perhaps hyperpyrexia was the solution.

Dr. Ingram asked if the speakers had any figures to show the percentage of patients who were married and who were single.

Wing-Cdr. G. L. M. McElligott wished to congratulate the two speakers on a very interesting joint paper. He believed that the trichomonas infestation in these cases of vaginitis was often not the whole of the story. He was very interested to hear the *Vibrio alkaligenes* mentioned. From two recent cases of resistant non-gonococcal urethritis in the male this organism had been recovered in pure culture; whether it was a causative organism or not he did not know, but the two patients had never had gonorrhoea and he was interested to hear that the organism had been found in company with the trichomonas.

He would like to hear from the meeting or the readers of the papers whether an oral arsenical such as atabrin had ever been tried for this condition. Squadron Leader Morton had told him that she had found that in women who had coincidental syphilis and were being treated with N.A.B. their trichomonas infestation did seem to improve. The matter had not been followed up,